type. The forms of *manto* in this series are distinctly darker altogether than in the usual type, and the more they lose their markings, so much the more slaty (and Pyrenean like) the ground colour becomes.

As regards markings, Swiss *caecilia* occur, I have specimens, absolutely without rusty markings or black eyespots. On the other hand, rusty marks and eyespots on the upper surface of the males occur in var. *caecilia* (constans, Eiff.?). I have a specimen, a \mathcal{J} , with a rusty blotch and two black spots. On the under surface some rusty coloration is more frequent.

I conclude, therefore, that var. caecilia is a geographical race of manto rather than a distinct species, as such it requires, no doubt, a varietal name, which Staudinger supplied by calling caecilia "ab. et v." This is certainly open to objection, but so far as I know may stand good. Herr G. Eiffinger in Seitz, by the curious misreading of Elwes' note on the form, which Mr. Warren quotes, gives it the name constans. This name appears to stand good if Staudinger's action is insufficient; constans, Eiffinger, of course, not constans, Elwes, a non-existent quantity. Eiffinger calls it constans, Elwes, in the text, p. 99, and figures it on plate 36, g 6 and 7, with the word constans under each figure. Now we have also gararniensis, Warren. Whichever of these names be accepted, it is not a specific but a varietal name. The two forms are closer together perhaps than are, for example, the several forms of *glacialis*, and have no claim to specific rank such as *gorgone*, the Pyrenean representative of mnestra has. The chief difference between manto and gararniensis is that the latter is larger, or rather that many Swiss forms of manto are very much smaller (some being as large). Large size is, however, a characteristic of various species as we approach and enter the Spanish region.

EXPLANATION OF PLATES.

Plate III.—Neuration of E. manto, E. manto var. caecilia and E. euryale. Figs. 1, 2, 3, 4, E. manto var. caecilia. Figs. 5, 6, 7, 8, 9, 10, 11, 12. E. manto. Figs. 13, 14, E. euryale.
Plate IV.—Appendages of E. manto and var. caecilia.

Figs. 1, 2, 6, Erebia manto. Figs. 3, 5, Erebia manto var. caecilia. Fig. 4, Erebia euryale.

Myrmecophilous Notes for 1913.

By H. St. J. K. DONISTHORPE, F.Z.S., F.E.S.

In consequence of the fact that I am now engaged in writing a book on the British Ants, which takes up all my spare time, and which I propose to follow with a second volume on the British Myrmecophilous Fauna, my notes for 1913 must be considerably curtailed, and in fact be confined to the bare records of captures, new localities, etc., without drawing any conclusions from the results obtained, or referring to similar observations by others, or myself, in the past. I have already published my observation on the myrmecophilous fauna of Lundy, and the important captures of *Clariger longicornis*, Müll., and *Aenigmatias blattoides*, Mein., which somewhat simplifies matters.

I take this opportunity to ask all entomologists who have unpublished records of ants, or myrmecophiles, from any part of Britain, to kindly communicate with me. I shall also be pleased to name ants for anyone who may possess a British Collection, or unnamed specimens.

FORMICIDÆ.

Subfamily MYRMICINE.

Myrmecina graminicola, Latr.—2 deälated $\Im \ \Im$, and $\Im \ \eth \$ were taken in company with Lasins flavus at Bletchington, Oxon., on May 17th; $6 \ \Im \$ carrying their larve, in a nest of L. mixtus at Box Hill on May 25th; and a dealated \Im , in a nest of L. mixtus at Box Hill on September 25th.

Solenopsis fugax, Latr.—A few $\notin \notin$ were taken by Crawley and myself in company with Formica fusca var. fusco-rutibarbis at Sandown, I. of W., on August 10th.

I discovered a large colony at Blackgang Chine, on August 26th, situated in a large block of green-sand, two feet long by a foot broad. Vast quantities of $\notin \notin$, great numbers of $\Im \ \Im$ and a few winged $\Im \ \Im$ occurred. Eggs, larvæ, \Im and \notin pupæ and one \Im pupa (subsequently reared) were present. No other ants, or ants' nests were near, and no *Aphidae*, noi myrmecophiles were found.

Myrmica laevinodis, Nyl.—Colonies were found at Tenby, and abundant under stones on the marshy ground in front of Manorbier Castle, in Pembrokeshire, in April. Four partly winged \Im \Im occurred in a nest at Bletchington, May 12th.

Myrmica ruginodis, Nyl.—Tenby and Manorbier in April.

Myrmica scabrinodis, Nyl.—Colonies at Tenby in April, one under the same stone as L. flarus, April 25th. An isolated deälated \mathfrak{P} , under a stone on April 27th. Three colonies under the same stones as L. flarus at Bletchington, on May 17th.

In July I found a form of *scabrinodis* at Rannoch, in two nests of F. *ruta* var. *alpina*, inhabiting part of the latters' hillocks, only $\bigvee \bigvee$ and larvæ being found. The shape of the antennæ exhibits a slight transverse ridge (more developed in some specimens), reaching across from the lateral tooth and forming a small point, or angle, opposite to the same. These specimens may represent the var. *scabrinodo-lobicornis*, Forel.

Myrmica scabrinodis, Nyl., var. sabuleti, Meinert.—Tenby, Pembrokeshire, and the Landslip, I. of W. One of the latter in the same mound as *L. flavus*.

Myrmica lobicornis, Nyl.—Two deälated 99, July 29th and September 22nd, crawling on paths at Weybridge.

Stenamma westwoodi, West.—A \notin occurred in a nest of Lasins mixtus at Box Hill, on May 28th.

Leptothorax acerrorum, F.-A deälated 2, 3 3, larvæ and pupæ,

in a nest of *Formica sanguinea* at Weybridge, on July 12th. A \gtrless in a nest of *F. exsecta* at Parkhurst Forest, I. of W., on August 23rd.

Leptothorax nylanderi, Först.—A deälated \mathfrak{P} in a nest of L. mixtus at Box Hill on September 7th.

Tetramorium caespitum, L.—Colonies not uncommon at Tenby, one under the same stone as L. *tlarus*, on April 23rd. A small colony at roots of Arenaria maritima at Blackgang Chine, I. of W., August 26th, all the $\notin \notin$ being very small.

Subfamily Dolichoderine.

Tapinoma erraticum, Latr.—a fine colony was found in the New Forest, on June 23rd, situated in a small, low, round mound made of bits of cut grass, burnt heather, etc. The nest was traced by carefully watching the \notin \notin in the neighbourhood, only a few being out as the day was cold and cloudy. It contained a few \Im \Im , very many winged \Im \Im , two deälated \Im \Im , a large number of \nexists \Im , \Im , \Im , and \oiint pupæ, and some larvæ.

Another large colony was observed at Weybridge, on July 29th, in a sandbank. Two deälated $\Im \Im$ were present, and the $\Im \Im$ were the largest specimens I have ever seen.

Subfamily CAMPONOTINE.

Lasins fuliginosus, Latr.—On August 16th at Apse Heath, I. of W., \bigotimes were traced from a copse to an oak tree on a hill at a considerable distance from the copse. A number of \mathcal{J} were out on the tree trunk, and the nest was situated just below the turf at the roots. A dealated \Im with the gaster enormously distended with eggs, and surrounded by a mass of \bigotimes , was found in the carton cells at the top of the nest.

Lasius niger, L.—Common at Tenby, a \mathcal{J} was found under a tin on the sand-hills, on April 26th. A very distended deälated \mathcal{Q} was found in a nest at Box Hill, on July 30th. Naked pupe were abundant in a mound-nest at Sandown on August 7th.

Lasius niger, L., var. alieno-niger, Forel.—A colony was found at Bletchington in May.

Lasius alienus, Först. — Colonies were noticed at Tenby and Bletchington.

Lasins flacus, F.—Common at Tenby and Manorbier. Two dealated \Im \Im were observed in one nest at Bletchington, on May 14th, and in another in which no \Im could be found, some very large dark \oiint \Im , many times larger than ordinary \oiint \Im , occurred.

Isolated deülated 9 9, some with egg-packets, were seen at Blackgang Chine, on August 26th, under stones and lumps of soft green-sand.

Lasing umbratus, Nyl.—A marriage flight had evidently taken place at Weybridge on July 29th, since many dealated \Im \Im were running about on paths on the heath on each side of the railway, several had been captured by F. *rufa* and F. sanguinea $\notin \notin$, and were being dragged as prey to the nests of the latter. A dead winged' \mathfrak{P} was also found in a sanguinea nest.

A marriage flight occurred at Sandown, I. of W., on August 27th, \Im being observed in the garden of our house and on the pavements near by, and a \Im was captured, which had already removed some of her wings. A deälated \Im was found fighting with some L. niger \S \S near a nest of the latter, a fact of considerable interest.

A large form was found in some numbers on the sand-hills at Tenby (near to the continental L. $a \not jinis$, Schenck, which might almost be called $a \not jino-umbratus$, though most nearly related to umbratus), much digging in the sand unfortunately only produced $\notin \notin$. Specimens taken there alive and introduced into my L. mirto-umbratus observation nest, were all killed, whereas umbratus $\notin \notin$, from Wellington College this year (and from Weybridge and other places last year), were accepted by the inhabitants of my nest. The Wellington College nest (kindly pointed out by Dr. Joy) was situated in the ground, at a spot where formerly a tree root or stump had been present, this being nearly entirely decayed. Cells of a hard earthy carton were found attached to the roots of plants. These, through the kindness of Prof. Poulton, were submitted for me to Prof. Newstead for analysis, and he reported as follows :—

"The nodular concretions attached to the roots of the plant are composed of :—

1. Numerous hyphie of a fungus, with spores, apparently.

- 2. A few fine root-fibres (?) of the plant supporting the nodules.
- 3. The bark of the root (rhizome) (?) of the plant supporting the nodules. These are much more numerous in the dark coloured nodules than in the paler ones.
- 4. Quartzite grains. These predominate.

My impression is that the presence of the fungus is due to the 'cement' used by the ants for fastening the quartz grains, etc., together."

Some of the root fibres and bark were, no doubt, taken from the remains of the tree root or stump before mentioned. This seems to prove that *umbratus* can, and does, make "carton." Similar cells of a darker nature found at the roots of heather in an *umbratus* nest at Weybridge also contain fungus.

Formica rufa, L.—Many nests were very late this year; at Weybridge only small larva were present on May 4th.

Formica rafa, L. var. alpina, Santschi.—Some seven colonies of this variety were observed at Rannoch in July, deälated $\mathfrak{P} \mathfrak{P}$ were present (three in one nest and two in others), but no winged forms could be found. Some pseudogynes occurred in one colony.

Formica rufa, L. var. rufo-pratensis, Forel.—Several nests, superficially like F. exsecta nests, were found at Parkhurst Forest in clumps of grass (Aira caespitosa) on June 29th, one deülated \mathfrak{P} was taken, but only \mathfrak{P} cocoons were present.

Formica pratensis, De G.-A number of colonies were found at

Rannoch, when in company with my friend Mr. Morice, in July; $\mathcal{J} \mathcal{J}$ and winged $\mathfrak{P} \mathfrak{P}$ were abundant in one nest on July 17th, and four deälated $\mathfrak{P} \mathfrak{P}$ were taken in this nest. A few Pseudogynes were present.

Formica sanguinea, Latr.—In 1912 it appeared almost impossible to find a deälated \mathfrak{P} in the nests, at Woking; in 1913, on the other hand they were plentiful. On May 21st, deälated \mathfrak{P} \mathfrak{P} were found in every nest, in one no less than 37 specimens being counted. For the first time, at Woking, I found pseudogynes of this ant, they being present in several nests and in one quite 10% of the \mathfrak{F} \mathfrak{F} in the nest were pseudogynes.

Formica fusca, L.—Common at Tenby, in April, under stones on the cliffs and in fields, and on banks on the east of the town. Deälated $\mathfrak{P} \mathfrak{P}$ were abundant in most nests, many of them being microgynes.

At Rannoch, in July, two colonies were found inhabiting deserted nests of F. rufa and *exsecta* respectively.

Naked pupe were found in some numbers in a nest at Box Hill, on July 30th, and in Parkhurst Forest on August 23rd.

Formica fusca, L., var. rnbescens, Forel.—A colony situated in the side of the cliff at the Landslip, I. of W., was found on August 21st, it contained many $\mathcal{J} \subset \mathcal{J}$, one winged \mathfrak{P} , many large $\mathfrak{P} \not\mathfrak{P}$, and \mathfrak{P} cocoons.

Formica fusca, L., var. fusco-rujibarbis, Forel.—Naked pupe were found in a nest of this variety at Sandown, I. of W., on August 13th.

Formica rutibarbis, F.—Some seven colonies were again found at Weybridge, five deälated $\mathfrak{P} \mathfrak{P}$ occurred in one nest but no winged forms could be found, although the nests were visited in May, June, July, and September.

COLEOPTERA.

Homoeusa acuminata, Mürk.—In a nest of L. mixtus, Box Hill, May 23rd.

Thiasophila angulata, Er.—With F. rufa, L., var. rufo-pratensis, in Parkhurst Forest, August 23rd.

Thiasophila inquilina, Märk.—With L. fuliginosus, Oxshott, May 25th and June 2nd; Apse Heath, I. of W., July 16th.

Dinarda märkeli, Kies.—Larvæ in nest of F. rufa, Weybridge, July 12th.

Dinarda hagensi, Wasm.—In some numbers with F. exsecta, Parkhurst Forest, August 22nd.

Atemeles emarginatus, Pk.—In two nests of F. fusca, at Tenby, April 25th. Myrmedonia limbata, Pk.—With L. niger, Tenby, April 25th, with L. flavus, Bletchington, May 14th.

Drusilla canaliculata, F.—In nest of F. fusca, Tenby, April 25th; with L. niger and with a half dead M. scabrinodis \notin in its jaws, Bletchington, May 18th; with Ponera coarctata, Box Hill, May 16th; larva in nest of M. ruginodis at Nethy Bridge, July 20th; and with F. fusca, L., var. fusco-rutibarbis at Sandown, August 10th.

Notothecta flaripes, Gr.-In nest of F. rufa, L., var. alpina, Rannoch, July 16th; and F. rufa, L., var. rufo-pratensis, Parkhurst Forest, August 23rd.

Clariger testaceus, Preys.—With L. flarus at Tenby, common in one nest in a field, April 23rd; a pair in côp. in a nest on April 25th. With L. niger, Bletchington, May 14th.

Coccinella distincta, Fald.—On *I'. rufa* nest at Woking, May 21st, June 4th.

Clythra 4-punctata, L.—Larva in nest of F. rufa, L., var. rufopratensis at Parkhurst Forest, August 11th.

Opatrum sabulosum, L.—A pupa taken in a nest of F. fusca, L., var. fusco-rutibarbis, at Blackgang Chine on August 26th, taken home and subsequently hatched about September 3rd, in my mixto-umbratus nest (the ants never attacked either the pupa or the perfect insect) where it lived for some time.

BRACONIDÆ.

Enphorus bistigmaticus, Morley.—Hovering over $\forall \forall$ on F. rufa nest at Weybridge, July 12th. This species is not uncommon at Weybridge.

Pachylomma baccata, Bréb.—Very large specimens (of this species according to Morley) were taken hovering over $\notin \notin$ on a nest of F. rafa, L., var. rafo-pratensis in Parkhurst Forest, on June 29th.

Typical specimens were observed at Weybridge, hovering over $\notin \notin$ of *F. rutibarbis*, *F. sanguinea*, *L. flavus* and *Tapinoma erraticum*, on July 29th.

CHALCIDIDÆ.

Spalangia erythromera, Först.—In nest of L. fuliginosus, Oxshott, September 9th.

DIPTERA.

Phora formicarnm, Verrall.—Hovering over $\notin \notin$ of F. sanguinea at Woking, May 21st; F. sanguinea, L. flavus and Tapinoma erraticum at Weybridge, July 29th; and L. niger at Shanklin, August 21st; and L. niger at Blackgang Chine, August 26th.

Phyllomyza lasiae, Collin.—With L. fuliginosus, Wellington College, September 30th.

Ceratopogon myrmecophilus, Egger.— $\mathcal{J} \mathcal{J}$ hovering over F. rufa nest at Weybridge, September 22nd.

COCCIDÆ.

Ripersia subterranea, Newst.—In nest of L. alienus, April 23rd; L. niger, April 29th at Tenby; F. fusca, L., var. fusco-rufibarbis at Sandown, August 22nd.

Ripersia toudini, Newst.—In nest of *L. niger* at Bletchington, May 14th.

Newsteadia floccosa, De G.-In F. rufa nest, Weybridge, July 12th.

Ortheziola vejdovskyi, Sulc.—In nest of L. niger at Tenby, April 25th; L. flavus at Manorbier, April 28th.

COLLEMBOLA.

Cyphodeirus (Beckia) albinus, Nic.—With Tetramorium caespitum at Tenby, April 23rd; Tapinoma erraticum at Weybridge, June 29th; Lasius niger, Bletchington, May 14th; Sandown, August 10th; L. alienus, Box Hill, May 16th; L. flacus, Bletchington, May 14th; L. nuxtus, Box Hill, May 16th; F. exsecta, Parkhurst Forest, August 11th and 23rd; F. rufa, Weybridge, May 4th; F. fusca, Tenby, April 23rd; F. fusca var. fusco-rufibarbis, Sandown, August 10th, and Blackgang, August 26th; F. fusca var. rubescens, Landslip, I. of W., August 21st; and F. rufibarbis, Weybridge, July 29th.

MYRIAPODA.

Blanjulus guttulatus, Gerv.—With L. fuliginosus, Wellington College, September 30th.

Polyxenus lagurus, L.—In nest of F. fusca, Box Hill, September 7th; and abundant in two nests of F. rufa, pointed out to me by W. E. Sharp at Wellington College, on September 30th.

ARANEINA.

Thyreosthenius biorata, Camb.—In nest of F. pratensis at Rannoch, July 17th.

Evansia merens, Camb.-In nest of F. fusca at Avieniore, July 18th.

Tetrilus recisus, Camb.—Young with L. fuliginosus at Oxshott, June 2nd, and a number of egg-sacs (of this species according to Randell Jackson) situated on the carton cells of this nest on September 9th.

Cicurina cinerea, Panz.-In L. mixtus nest at Box Hill, on July 30th.

Micaria pulicaria, Sund.—With L. niger, August 7th, and F. fusca var. fusco-rujibarbis, August 10th, at Sandown.

Harpactes hombergi, Sep.—With F. fusca var. fusco-rutibarbis, Blackgang, August 26th, and the Landshp, August 28th.

ACARINA.

Cilibano comata, Leon.—On larvæ in a nest of L. niger, at Tenby, April 24th.

Trachyuropoda bostocki, Mich.—In some numbers in a nest of L. fuliginosus, at Apse Heath, I. of W., on August 16th.

Laelaps cuneifer, Mich.—In nest of L. mixtus at Box Hill, May 22nd; and L. fuliginosus, at Apse Heath, August 16th.

Antennophorus pubescens, Wasm.—On $\notin \notin$ in a nest of L. flavus, Box Hill, July 30th.

Antennophorus grandis, Berl.—On $\notin \notin$ in a nest of L. fuliginosus at Apse Heath, August 16th.

CRUSTACEA.

Platyarthrus hoffmanseggi, Brandt.—In nests of Myrmica ruginodis and M. scabrinodis, at Tenby, in April; L. niger, Tenby and Manorbier, in April, Bletchington, in May; L. alienus, Tenby, in April, Box Hill, in May; L. tlarus, Tenby and Manobier, in April, Bletchington, in May; L. mixtus, Box Hill, in May; L. tuliginosus, Apse Heath in August; F. exsecta, Parkhurst Forest, in August; F. fusca, Tenby in April; F. fusca var. rubescens, and var. fusco-rugibarbis, Landslip, in August.

No. 51.—" Lasius mixtus, Nyl., in Britain," Ent. Record, xxiii., 236-238 (1911).

No. 52.—"Ants at Kew," Royal Botanic Gardens, Kew Bull., No. xii., li., 367-369 (1911).

No. 53.—"A Messmate of Ants" (Lomechusa strumosa, F.), Marvels of the Universe, V., 220.222 (1911) (with photographs).

No. 54.—"A Revised List of the British Ants," *Entomologist*, xliv., 389-391 (1911).

No. 55.—" Experiments on the Formation of Colonies by Lasius fuliginosus $\mathfrak{P} \mathfrak{P}$," Trans. Ent. Soc. Lond., 1912, 664-672. (Joint paper with C. Crawley).

No. 56.—" Myrmecophilous Notes for 1911," Ent. Record, xxiv., 4-10, 34-40 (1912).

No. 57.—"A Fly that is Born in Ants' Nests" (*Microdon mutabilis*, L.). Marvels of the Universe, xix., 764-767 (1912) (with photographs).

No. 58.—" Mites that live in Ants' Nests," Marcels of the Universe, xix., 778-780 (1912) (with photographs).

No. 59.—" Dairying Ants" (Ants and Aphidae), Marvels of the Universe, xx., 804-806 (1912) (with photographs).

No. 60.—" The Founding of Colonies by Queen Ants," Int. Ent. Cong. Oxford, 1912, II., 11-77 (1913). (Joint paper with C. Crawley.) No. 61.—"Ants as Honey Pots" (Myrmecocystus horti-deorum, McCook), Marvels of the Universe, xxiii., 940-943 (1912) (with photographs).

No. 62.—" The Wood Ant" (Formica rufa, L.), Marvels of the Universe, xxvii., 1099-1103 (1912) (with photographs).

No. 63.—" The Agricultural Ant of Texas" (Poyonomyrmex molefaciens, Buck.), Marvels of the Universe, xxviii., 1159-1162 (1912) (with photographs).

No. 64.—"On Some Remarkable Associations between Ants of Different Species," *Report Lancs. Chesh. Ent. Soc.*, xxxvi., 38-56., 1912 (1913).

No. 65.—"Some Races of Ants New to Britain," Ent. Record, xxiv., 306 (1912).

No. 66.—"Some Notes on the Genus Myrmica, Latr.," Ent. Record, xxv., 1-8., 42-48 (1913) (with plate and wood-cuts).

No. 67.—" Myrmecophilous Notes 1912," Ent. Record, xxv., 61-68., 89-97 (1913) (with wood-cuts).

No. 68.—"Ants and Myrmecophiles on Lundy," Ent. Record, xxv., 267-269 (1913) (with plates).

No. 69.—" Aenigmatias blattoides, Meinert, captured in Scotland," Ent. Record, xxv., 277-278 (1913).

No. 70.—" Notes on the capture of *Claviger longicornis*, Müll., and a Description of the supposed Larva," *Ent. Record*, xxv., 290-294 (1913) (with plate).

Collecting in the Horley District, 1911 and 1912.

By H. BAKER-SLY, F.E.S.

The following notes, I am afraid, will give but a very imperfect list of the Lepidoptera to be found in our district, firstly as I had no intention of writing any retrospect, and secondly because I have done very little collecting in our immediate neighbourhood this year.

The usual early insects, such as Hybernia rupicapraria, H. marginaria (progemmaria), H. leucophacaria (one var. marmorinaria taken on February 16th on a fence), and Phigalia pedaria (pilosaria) were common everywhere during February and March, and Polyploca plavicornis was fairly common and in good form in Worth Forest. An excursion for "Sallowing" on March 26th yielded but few insects, but *Eupithecia abbreviata* was flying amongst the bushes, and I secured some fine specimens. By early April the sallow bloom was attracting freely, and Tueniocampa pulverulenta (cruda), T. gothica, T. gracilis, T. instabilis, T. stabilis, T. munda, Xylocampa areola (lithorhiza), and Pachnobia rubricosa all fell more or less commonly into the beating tray, as well as the hibernating Cerastis vaccinii and Scopelosoma satellitia, and Anticlea badiata was taken commonly on the wing. Brephos parthenias, as usual, was common in Worth Forest on sunny days, and a trip by night, on April 15th, found Lobophora carpinata (lobulata) in considerable numbers. On April 13th I went to Worth Forest for Aplecta tincta larvæ, but only found three after much searching. In the breeding cages there emerged, towards the end of April, several fine Pygaera cartula (larvæ from Holmwood Common, August 15th, 1912), one Notodonta ziczac (Horley larva, June 30th, 1912) and Pachys strataria (prodromaria) (Horley larvæ, June, 1912).